Wild, Wild Life

The early biologist catches the bird

Sandia's feathered friends offer lessons to wildlife biologists

Its heart beating rapidly, a wild gray flycatcher sits in the palm of a steady hand, making side-eye contact and shaking, waiting for just the right moment to escape from its perceived human predator.

The moment lasts mere seconds, but it's filled with emotion, from fear to connection to protection. Gathering courage, the bird flies back into Sandia open space, its home for a few more weeks until the weather starts to change.

Moments like this don't happen for most people, but for a handful of Sandia biologists in the ecology program, they do. On a regular basis, biologists spend their days working with birds, looking for reptiles and monitoring other wildlife around the Labs.

The days they get to be in the field are their favorites, and some — particularly the shifts spent with birds — begin well before sunrise in a parking lot where the team gathers their gear and jumps in dusty trucks, flipping on headlights and driving 20 minutes southeast in the dark.

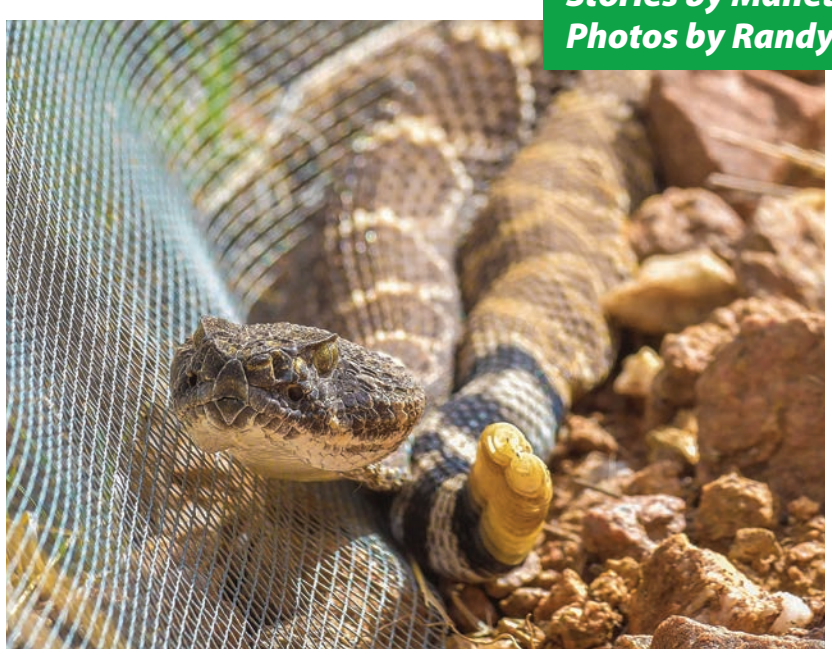
(Continued on page 4)

CATCH AND RELEASE — Sandia Labs wildlife biologist Steve Cox releases a gray flycatcher on Sandia property. Steve has been gathering data on birds for more than 30 years, both at Sandia and in his free time. He spends weekends at the Rio Grande Nature Center watching birds, and he searches for them in the mountains. He has lists of birds he's seen everywhere from his backyard to all over the globe.

Stories by Manette Newbold Fisher
Photos by Randy Montoya

Slithering science

Sandia biologists collect reptile, amphibian data to monitor long-term trends



SLITHERING STUDY — A 3.5-foot western diamondback rattlesnake rests on a drift fence set up by Sandia wildlife biologists. Traps are set next to the drift fence to capture reptiles and amphibians for analysis during the summer months.

It's not every day you come across a 3.5-foot western diamondback rattlesnake at work, but there are a few people at Sandia who wish they did.

"Every day we say, 'We're gonna get a diamondback,'" said Sandia intern Austin Lewandowski in late July, right after coming upon one in Sandia's southeast open space. He and wildlife biologist Evan Fahy were checking reptile traps that morning at two sites, and the second area saved the best for last.

With black and white-striped bands just below the rattle, the snake relaxed between two traps set up on either side of a two-foot mesh fence. As the biologists approached, the diamondback lifted its head and looked right at them. They thought it would rattle, but the snake remained mellow as Austin lifted it slightly with a snake

(Continued on page 5)

Inside . . .

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Small-business recycling ventures propelled by Sandia engineering

Local assistance aims to help companies make national impact in energy sector and materials

By Troy Rummler

Along a stretch of Route 66 that runs through rural eastern New Mexico stands a defunct ethanol plant in the town of Tucumcari. Still hanging inside the building, calendars from 2010 mark the year it closed, and six massive fermentation tanks — each one 35 feet tall and 55,000 gallons — sit empty.

Drought has depleted local corn harvests that were supposed to serve as feed stock, rendering the facility economically useless and spoiling two attempts to reopen it. A third try began in 2016, when Tucumcari Bio-Energy purchased the plant. This time, says the company, things are going to be different because it's not going to use corn.

Through New Mexico Small Business Assistance (NMSBA), Sandia is solving technical challenges for Tucumcari Bio-Energy and, in a separate project, helping a cohort of companies led by PJ Woodlands to figure out how to market new composite materials made from forest slash.

Both companies are pursuing innovative ways to recycle waste, and both projects were among 10 recognized by NMSBA this year. In 2017, the state of New Mexico, along with Sandia and Los Alamos national laboratories, invested $4.6 million helping 346 small businesses in 28 counties through the NMSBA program. Since its inception in 2000, the program has helped 2,797 businesses in all 33 New Mexico counties.

Sandia assistance is advancing both companies' plans. Tucumcari Bio-Energy has reduced its financial risk and can pursue financing to reconfigure the plant.

(Continued on page 7)

WASTE MANAGEMENT — Tucumcari Bio-Energy president Bob Hockaday examines a boiler used to heat digestion tanks. (Photo by Norman Johnson)

New Mexico Kids in Crisis

Community speakers review history, data and the difficult path forward

By Stephanie Holinka
Photos by Lonnie Anderson

Sandia's Community Engagement Speaker Series recently hosted "New Mexico Kids in Crisis," and the discussion was a difficult one.

Recent high-profile cases of extreme child abuse — abuse that resulted in the tragic deaths of children — have filled Albuquerque news outlets. Overall, New Mexico's high, multigenerational poverty and substance abuse rates contribute to its deep and long-standing child welfare challenges, speakers agreed.

Dr. Andrew Hsi, a family medicine and pediatric practitioner and director of the University of New Mexico Health Sciences Institute for Resilience Health and Justice, offered context for the complex issues that contribute to New Mexico's child welfare problem. Hsi provides specialized care for families affected by second-generation adverse childhood experiences, such as parental substance abuse disorders, family violence and parental mental illnesses.

COMPLEXITY IN ADVERSE CHILDHOOD EXPERIENCES — Dr. Andrew Hsi, a family medicine and pediatric practitioner and director of the UNM Health Sciences Institute for Resilience Health and Justice, discusses the complex and varied issues that contribute to New Mexico's child welfare problem.

Child abuse and neglect studies

Hsi discussed the CDC-Kaiser ACE study published in 1998, one of the largest investigations of childhood abuse and neglect, and its impact on health and well-being in later life. The study identified the types of early adverse childhood experiences (prior to age three) that directly contribute to adverse outcomes: emotional abuse, emotional neglect, physical neglect, physical abuse and sexual abuse.

Hsi also talked about the household dysfunctions that hurt children, including witnessing domestic violence, household substance abuse and mental illness, divisive parental separation or divorce and an incarcerated family member. These early experiences, repeated throughout early life and from generation to generation, create toxic stress that leads to brain changes that affect a child's ability to make decisions.

A 2010 study of five states by the Centers for Disease Control and Prevention found that 60 percent of New Mexicans had experienced at least one adverse childhood experience, and 17 percent had four or more. The original research found a strong correlation between four or more such events and poor long-term health outcomes.

PACKING UP FOR KIDS — Members of the Sandia workforce donated more than 50 backpacks to the Children, Youth and Families Department, for distribution to children on their first day in the state's care.

The survey also found that 20 percent of New Mexicans experience physical abuse or live in a household with at least one mentally ill family member, and 7 percent have a household member in prison.

In the study, New Mexico led the five states in the percentage of children who experience verbal abuse (28 percent) and witness domestic violence (19 percent). New Mexico also led in the percentage of children sexually abused (13 percent) and those living in a household affected by substance abuse (29 percent).

Abuse statistics constant for generations

Perhaps more shocking and rarely discussed, Hsi said, is the fact that abuse statistics nationwide have remained consistent across generations since before the Great Depression and World War II, but are rarely talked about.

Hsi noted New Mexico is different from other states in that it has nearly double the national rate of babies born with neonatal opioid withdrawal syndrome. He recommended working to reduce prenatal and postnatal alcohol and drug use and providing early and effective treatment for children who have adverse childhood experiences.

"Women and men must prevent unintended pregnancy, because this burden falls both on women and on men. Each parent must provide financial support for every child," he said.

He stressed that change will require resilient and survivor-friendly systems of care for those with adverse childhood experiences.

"Preventing ACEs means that we have to embrace the family and begin to make a difference for the whole family," Hsi said.

State faces the challenges

Hsi's talk was followed by Monique Jacobson, secretary of the New Mexico Children, Youth and Families Department.

A New Mexico native with a successful career in private industry, Jacobson returned in 2011 to serve as secretary of the Tourism Department, where she introduced the "New Mexico True" branding. Governor Susana Martinez asked her to lead CYFD four years later.

She acknowledged the dire state of child welfare in New Mexico, and the intense concern rightly raised by recent news coverage of gruesome neglect and abuse cases, including accounts of CYFD's failures to remove children prior to violent incidents.

"How can this happen? I wonder this too. It keeps me up at night, and it has kept me up at night for the last four years," Jacobson said.

"Child abuse is one of the weirdest things. It's one of the things that every single person is against, even child abusers," she said. "Child abuse is also 100 percent preventable, and yet it happens. And it continues to happen. How does this work?"

CARING IN CRISIS — CYFD Secretary Monique Jacobson shares with a Sandia audience at the Steve Schiff auditorium the many challenges of her department's work of caring for children in crisis.

Drugs the major cause

Asked to give a single cause, Jacobson said, in about 80 percent of cases, it is drug addiction. Drugs amplify the myriad problems faced by families and make hard situations impossible, she said.

In her wide-ranging talk, she addressed the problems faced by struggling families, how the generational, cyclical nature of poverty and abuse affects brain development, and how adverse childhood experiences impact decisions that parents make.

Investigating child abuse and neglect is complex, Jacobson said, and protective services is just one part of the work that CYFD provides. Most people don't know that CYFD has no authority to remove a child from the home; that happens through the law enforcement process. The burden of proof required to remove a child from a home is high, requiring much more than an investigator sensing something wrong. She said CYFD has to provide legal proof that a child is at risk to law enforcement, and that can be hard to come by when a family may be trying to hide problems to avoid having a child removed.

Above all, Jacobson said, parenting is hard, and as a culture we don't want to talk about how hard it is.

She laid out the ways in which her department is improving its investigation process and treatment methods.

The number of field workers has increased by 30 percent, and the number of case workers is now at the national average, with further increases planned. The department has more workers than ever, and she's seeking to keep the good workers and reduce turnover. But the challenges are many, and the answers aren't simple.

"There's no silver bullet. There's no one thing we have to do to fix everything. So we have to do better at every single thing we do, every single day," she said.

How you can help

Jacobson said there are many ways that people can help struggling children. One is by becoming a foster parent.

"It's the toughest thing you'll ever do, but one of the best," she said.

If someone cannot foster, she suggested supporting a foster parent in the difficult and complex process of helping a child heal and move forward.

Another small way to help is by donating a backpack, as more than 50 Sandia attendees did at the talk.

"Backpacks change these kids' lives. On the day they come into custody, we give them a backpack, which lets them know that the whole state is rooting for them. It gives them something of their own, and it changes their day for them," she said.

Mission Families child welfare goals

The United Way of Central New Mexico Board's Mission: Families initiative seeks to reduce adverse childhood experiences by 50 percent by 2030.

Sandia was the first corporate sponsor for Mission: Families, and donated $50,000 to the initiative earlier this year through Community Involvement Corporate Contributions.

Lab News Notes

Editor's Note: Lab News seeks guest columnists with observations on life at the Labs or on science and technology in the news and in contemporary life. If you have a column (500-750 words) or an idea to submit, please contact Jim Danneskiold, the acting editor.

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Colorado national lab cuts water use in half, thanks in part to Sandia

DOE honors Martinez for help at data center

By Neal Singer

A Sandia engineer shared a DOE environmental award for halving the amount of water used last year to cool a high-performance computer data center at the National Renewable Energy Laboratory in Golden, Colorado.

David Martinez, engineering project lead for Sandia's infrastructure computing services, received the DOE's Federal Energy and Water Management Award for contributions to a water-saving technique that substitutes a reusable liquid refrigerant in place of evaporative-water cooling towers when outside temperatures are low enough to make that feasible.

Sandia plans in 2019 to complete installation of a similar system using the technique, David said. The advance is credited with saving NREL 1.15 million gallons of water last year, and he anticipates even more savings at Sandia, which has more high-performance computers.

The refrigerant's cooling process doesn't require an electrically powered pump. Instead, it relies upon simple convection for the fluid to rise to a location where it can give up heat to water enclosed in a tube of its own. The water rises to give up heat to the outside air, then drops as it cools and absorbs more heat from the returning refrigerant in a continuous shuttling cycle.

Unlike water cooling towers, no water evaporates during the process, which works when the outside temperature is at most a few degrees warmer than the heat being given off by the water. If the air is warmer than that, the evaporative cooling towers kick in. The combined process is called hybrid thermosyphon cooling.

More efficient facility designs also are employed to cool down the rooms housing the computers, said David. Improvements such as smart fans that self-adjust to blow only the air needed, without creating air whorls that themselves require more cooling, mean a syphon can cool even hotter rooms without need for the evaporative cooling tower.

The environmental awards recognize people and organizations who have made significant contributions to energy and water efficiency within the federal government.

KEEPING HIS COOL — Sandia engineer David J. Martinez examines the cooling system at Sandia's supercomputing center. (Photo by Randy Montoya)

David, who travels monthly to NREL to work on energy efficiency, shares the award with NREL scientists David Sickinger and Kevin Regimbal, along with Tom Carter of Johnson Controls and DOE's Matt Graham.

"I helped as a consultant on the design of NREL's data-cooling center for their first high-performance computing system," said David, who has 30 years of experience putting together heating, cooling and power systems. "I work with them on different systems. I collaborate on fuel cells, liquid cooling and other improvements. I like those guys. They're like me: they push the envelope in saving energy and water."

The victors will receive their awards on Oct. 23 at a ceremony at the United States Institute of Peace in Washington, D.C.

Sandia Serves

Photos by Katrina Wagner

THANKING THOSE WHO PROTECT — Sandia volunteers (left) gathered after work to assemble 930 care packages for local police officers in honor of the 9/11 Day of Service and Remembrance.

BAGFUL OF GOODIES — Tineca Quintana of Community Involvement delivered a care package to officer Mike Avila in honor of the 9/11 Day of Service and Remembrance. NTESS, on behalf of Sandia, provided a thank you to Albuquerque police officers for their dedication in protecting citizens.

Back to BASES

Recent seminars cover transit, national security and religious fundamentalism

By Jules Bernstein

Sandia's Bay Area Strategic Engagement Seminars (BASES) have brought some heavy hitters to the California campus this summer for seminars on topics ranging from the future of transportation to cross-disciplinary national security projects.

First at bat in June was professor Daniel Sperling from the University of California, Davis, who talked about the future of transportation. Sperling is founding director of the university's Institute of Transportation Studies. He's also a member of California's Air Resources Board, which created California's zero-emissions vehicle program and the state's emissions and low-carbon fuel standards.

Sperling made the case that the U.S. car-centric system is unsustainable. He said the country spends over $100 billion annually on road infrastructure, that transportation accounts for fully one-third of all the country's heat-trapping gasses and that mass transit only provides 1 percent of passenger miles traveled in the U.S.

Given Americans' clear preference for cars, Sperling predicts that a more sustainable transit future will consist of electric (including fuel cell) and automated vehicles, as well as ridesharing services. Sperling's predictions can be found by watching the video of his chat, or in his book, "Three Revolutions: Steering Automated, Shared and Electric Vehicles to a Better Future."

Following the talk, seminar organizer Andrew Kosydar concluded, "The future of transportation is uncertain, with rapid changes in technology potentially leading either to hellish gridlock or heavenly ease of personal mobility."

Creating dream teams to solve security challenges

The July speaker was Rod Ewing, co-director of Stanford University's Center for International Security and Cooperation (CISAC), which brings together scholars across the natural, physical and social sciences to find solutions to the most challenging national security problems.

Ewing discussed two CISAC projects: creating a comprehensive history of the nuclear program of the Democratic People's Republic of Korea based on open-source intelligence; and convening experts and stakeholders to understand the challenges of developing and implementing long-term U.S. radioactive waste disposal.

CISAC's approach to problem solving — bringing together experts in academia, government, military and beyond — is similar to Sandia's, Ewing said, advocating for deeper ties between Sandia and CISAC. The audience brainstormed on how to increase engagement, including co-hosting workshops and seminar series, and Sandia staff mentoring CISAC fellows.

Fielding questions about combatting religious extremism

Karima Bennoune came to Sandia to discuss her book, "Your Fatwa Does Not Apply Here." The book summarizes 300 interviews she conducted with people of Muslim heritage from 30 countries about how they are working to counteract fundamentalist oppression.

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COMBATTING RELIGIOUS EXTREMISM — International law professor and human rights expert Karima Bennoune spoke to Sandians about her new book, "Your Fatwa Does Not Apply Here." (Courtesy photo)

A professor of international law at UC Davis and expert on human rights, Bennoune undertook her epic journey from Mali to Afghanistan and beyond out of her frustration with what she refers to as "stagnant, politicized public dialogue about the clash of civilizations." Her extensive fieldwork and interviews help illuminate the stories of people fighting for their freedom worldwide.

Future BASES talks will be publicized in California Daily Announcements. Seminar organizers welcome suggestions; contact Andrew Kosydar or Anthony Juarez to help load the BASES.

Bird catchers

(Continued from page 1)

One morning in early August, the sky seemed especially thick and starless, a half moon shining from the very top of the night. Maybe clouds were left from the evening before, or perhaps it was the haze from distant wildfires. The roads were muddy and bumpy, and when the team arrived at their destination, it smelled like rain.

Team lead Steve Cox reminded the team of four to stay safe and watch for snakes, then they grabbed bags of nets and went their separate ways in the dark to set up the nets before sunrise, hoping to catch birds for monitoring purposes.

Where do the birds go?

The group works on an international collaborative program called Monitoring Avian Productivity and Survivorship, established in 1989. The first week of August was Sandia's last week participating in MAPS for the year. The following week they would start tracking migrating birds in the area. More than 1,200 MAPS monitoring stations are located across the country and Canada, with participating biologists providing data that give insight on avian population, breeding and the effects of weather, climate and habitat loss.

When Sandia biologists capture birds, they collect information on age, sex and body condition, and place a tiny metal band around one leg. Each band is stamped with a unique number. Biologists who catch a banded bird later can use the number to find out where and when the bird was first banded. The data collected ultimately adds to MAPS research on avian survival, reproductive rates and movement patterns.

"There are very specific protocols for every organization that participates in this program, and it's really great to be part of this," Steve said. Procedures describe how long to leave the nets up (six hours) and how often they should be checked. Every 30 minutes is standard.

Sandia biologists gather information not only to support national studies, but also to determine local trends. They try to track which birds come back every year, if any species are dwindling or increasing in number and where they may be migrating. It takes years to determine such changes.

Steve continued talking while setting up the nets, each about 40 feet long and 8 feet high.

"This is a mist net. It looks kind of like a big hair net, and it does a reasonable job of catching birds," he said, adding that the nets can only capture a small percentage of the birds in the area due to their relatively small sizes. "We're not sampling anything above these nets. Some people will say you're only catching a tenth of one percent. Yeah, but that's measurable."

While walking to the next net location, Steve paused to listen every once in a while.

"I was just listening to a songbird," Steve said. "Not only do we catch birds, we also are noting all of the other birds we encounter here either by seeing or hearing."

See-through skin: Scientists can blow across the bodies of some birds to part their feathers and see how much fat and muscle they have. Blowing across the feathers provides a clear view of accumulated fat through the bird's translucent skin. More fat tends to mean they are migrating or preparing to migrate.

MORNING MIST — Summer intern Austin Lewandowski checks a mist net used to catch birds on Sandia property. All captured birds are quickly analyzed and released.

Bird backpacks track threatened species

The team had been listening for gray vireos they are trying to track because the species is threatened. Last year, they placed small geolocators resembling tiny backpacks on 13 gray vireos to see where the birds go for the winter.

Sandia wildlife biologist Matthew Baumann came up with the idea for a few reasons. The gray vireo is listed as a species of concern in the state, and the geolocators provide more information, including where they migrate and spend the winter months. No one had put geolocators on gray vireos, and Kirtland Air Force Base happens to have one of the highest populations of the species in New Mexico.

Recording the time and angle of the sun, geolocators track roughly where the birds have been, and this year Sandia biologists were able to recapture four of the 13.

"It's pretty remarkable given that previous research on other species has shown that sometimes you only get one back," Matthew said, adding that they could capture more next year. "People have researched gray vireos and found that they nest in nearly the same tree as the year before. They come back at least within a couple hundred meters. They know the habitat they like, and where the best territories are."

Matthew said preliminary analysis suggests the Kirtland gray vireos spend their winters in Baja and southern Sonora, Mexico.

Ecology team educates workforce

Most people working at the Labs are surprised to find out Sandia has wildlife biologists on staff, Steve said.

The ecology program conserves plant and animal life on Sandia property and assists with ecological issues and concerns that arise during work at the Labs. They also collect data on plant and animal species to further understanding of resources on site, and educate members of the workforce on conservation. Team members collect biological inventory data to support site activities and maintain regulatory compliance while preserving resources. Plant and animal data collected by the ecology program also advances the understanding of on-site ecological processes.

Free bird: When this non-native parakeet was spotted in Tech Area 4 earlier this year, Sandia wildlife biologists rescued him and found him a new home. Technologist Anastasia Gaiser adopted the bird after trying to find its owner. His name is Meiko. (Photo by Anastasia Gaiser)

The ecology program is responsible for all biological and ecosystem resource management on DOE-permitted lands, including work areas, operational areas and remote areas.

"Ecology is a really important science, so it's great that Sandia supports what we do," said wildlife biologist Callan Pope.

The workforce is required to follow laws on wildlife and vegetation. The Migratory Bird Treaty Act makes it illegal to capture, handle, put at risk, kill or maim birds that are indigenous to North America. This can be difficult to explain to employees when birds or nests are discovered where technical or experimental work takes place. At times, biologists meet resistance from researchers under deadlines and those who don't understand why birds can't be moved.

"A lot of the challenge is trying to educate people on what we're doing and why we're doing it," Steve said. "Behavior modification is a big part of our job."

Steve tries to find something each individual can connect with when he educates them. For some, it's following laws; for others, it may be safety. Sometimes they can connect with the wildlife itself.

"There can be a lot of emotion associated, and you don't necessarily want to let emotion override in the situation," he said. "What I find is, if you can figure out what's important to them and try to work at that level, that sometimes helps. We don't have the luxury of sitting down and having therapy sessions with people on why it's important to have wildlife."

Other challenges of the job include being in the field when it's hot, cold, windy or bugs are out. In spite of the challenges, he said it's worth it to be outside regularly when most other Sandia employees are in offices or labs.

The best part of the job? "It's always the field work, no question, that's hands down," Steve said.

WING SPAN — Wildlife biologist Steve Cox examines the wings of a bird captured at Sandia. During this bird banding session, the ecology team caught ten different species of birds.

'No middle ground' for avian passion

Between net checks, Callan asked the team what they heard while they were out.

"Mourning doves, black-throated sparrows, Woodhouse's scrub jays, canyon towhee, probably a few others," said wildlife biologist Evan Fahy. The team chatted for a while about birds and other breeds they hoped to see. Callan wanted to see sparrows and at least one Cassin.

"I'm hoping we get a black-headed grosbeak," said Sandia intern Austin Lewandowski. "And a golden eagle," he said, laughing, as the nets generally catch small birds, not eagles.

The first catch of the day was the gray flycatcher, and Steve explained while some species look similar, each has some slight, unique differences. He explained how biologists look at the bird's bill, the web of the outer tail feather, its coloring and the wing span.

"One fascinating thing about these birds is their skin is transparent," Steve said. "We can blow across its belly, spreading the body feathers, and see muscles and bones. We subjectively measure the fat, which is important. During migration, the bird's whole body changes. Their flight muscles get bigger, and they put on fat. When not in migration, they have very little fat, and have to eat constantly for energy."

Once they have all the measurements they need, and a band is secured on one leg, the bird is set free again. If the team still has some time, they might talk about birds and laws, and bring up questions about avian survival: What are airports doing (or not doing) for birds? How does construction affect wildlife? And how can non-biologists help?

Their passion runs deep. It's more than a day job for some. Steve has a favorite bird tattooed on one arm. He spends weekends at the Rio Grande Nature Center watching birds, and searches for them in the mountains. He has lists of birds he's seen, everywhere from his backyard to six out of the seven continents.

"I used to think I was really a normal person, but when you get right down to it, I'm probably not," Steve said. "I do enjoy birdwatching. I've been collecting information on birds for 30 years. I don't want to tell people I have fun doing this stuff because I'm afraid they'll make me do something different."

Callan said she realized in college, "the people you meet who are passionate about birds are just very extreme. There's no middle ground. And getting birds in the hand, there's nothing like that."

WILDLIFE CONSERVATION — Wildlife biologist Callan Pope examines a bird captured at Sandia. Sandia's ecology team works to conserve plant and animal life, and assists with ecological issues that arise at the Labs.

Reptile round-up

(Continued from page 1)

hook, and it slithered up the hill and into the shade of a juniper bush.

"The venomous snakes are a little easier to handle," Evan said. "I think they know they've got you, where a nonvenomous snake really puts on a show."

In early, mid and late summer, the biologists check the traps in two locations on Sandia property, Monday through Thursday mornings and afternoons, hoping to find lizards, snakes and frogs. They might also catch a black, eight-legged vinegaroon here and there, or another type of insect. They only evaluate reptiles and amphibians, and everything that creeps, crawls, hops or slithers is noted and then set free.

Lady lizards: All Chihuahuan spotted whiptail and New Mexico whiptail lizards are female. The lizards reproduce through parthenogenesis, which is the development of an embryo from an unfertilized egg cell. Basically, they clone themselves. "It's Jurassic Park," said wildlife biologist Evan Fahy.

"Checking the traps at different periods in the summer can help provide a rough idea of optimal conditions for reptile activity," Evan said. "We can start keying in on things like reproductive timing and development. That's important when looking at long-term data sets. We look at whether or not those very important lifecycle events are shifting."

The data the team has gathered is new enough that long-term trends are not yet evident. Sandia wildlife biologists have been setting up and checking the current herpetofaunal traps for about six years to gather data on species in the area.

The traps are small boxes lined with mesh to allow air to flow through. They are placed next to the fence, and as reptiles run across the landscape, they sometimes hit the fence line, turn right or left, and end up in a funnel that leads them into a trap, where they'll wait until Sandia biologists arrive. During weekends, traps are open so reptiles aren't stuck for days.

Prior to deploying the current traps, Sandia biologists monitored reptiles and amphibians using pitfall traps and other methods that weren't as effective, said wildlife biologist Jen Payne.

"The State of New Mexico had been using these lobster-style herp traps for a project with Kirtland Air Force Base," Jen said. "I talked with the state herpetologist at the time, and he highly recommended these. So we built a bunch of traps, installed drift fences at our monitoring locations, and we've had great success detecting an increased variety of reptiles and amphibians. The traps are well ventilated, with insulated roofs, and there is a small crevice inside the trap where animals hide, creating low stress for the animals. The data we've collected is better than ever."

Reptile monitoring provides snapshots of diversity

The first area where biologists check traps is about a 15-minute drive southwest of Tech Area 3, and it's about the same distance to the second area, behind the Manzano Complex. Around 8 a.m. the same morning they spotted the rattlesnake, Evan and Austin drove to the southwest area. The weather was a nice 77 degrees and light peered through gray monsoon clouds gathered around the Sandias. Listening to classical music on the radio, they drove until a dirt road past the Solar Tower turned to mud.

The soil allows blue-green sagebrush to grow in the area, an abrupt transition from the Chihuahuan grasslands just to the east. There is almost a wall between the two types of vegetation, and Evan said there's something in the soil that forces the change. The soil and vegetation are important factors in monitoring reptiles, as both will affect the types of animals that live there, Evan said.

In the southwest area, Evan and Austin captured a New Mexico whiptail lizard. Holding it by one of its back legs so it could move freely between his fingers, Evan described the patterning and zigzags on its skin that define the species. Then he quickly gathered baseline monitoring information and made a couple of morphological measurements. The lizard was female, and captured for the first time.

Austin then painted its belly with water-based, nontoxic, orange nail polish so they'll know if they capture the lizard again. After that, the lizard was on its way through the sagebrush.

LEAPIN' LIZARDS — Sandia wildlife biologist Evan Fahy assesses a New Mexico whiptail lizard captured at Sandia. The Labs' ecology program gathers baseline monitoring data on reptiles and amphibians to determine long-term trends.

"The first couple years that we're out there doing the monitoring, it really just provides us a snapshot idea of diversity and relative abundance in a given habitat," Evan said. "Then as the years go on, as we continue to monitor at a given site, we are getting that long-term data so we can detect changes over time and perhaps infer some of the causes of those changes. That will help us make recommendations for land use decisions."

Evan said the team has been gathering data from weather stations and trying to correlate whether detection rates are changing due to a shifting climate or human land use decisions. Could the changes be natural fluctuations within the species? Only time will tell.

"The value in this type of monitoring is definitely the long-term data sets," Evan said.

Fast feet: All whiptail lizards are notoriously fast, according to Sandia wildlife biologists. Even if they are captured in a herpetology trap for monitoring purposes, the lizards might escape before the team can assess them.

Soft-spoken species

"Reptiles play a simple but important role in food webs," Evan said. "They control both small rodent and insect populations, which has a benefit not only for the ecosystem, but mankind. Additionally, they are a food source for many other animals higher up in the food chain."

Evan studied mammals in school but when he was hired at Sandia, the ecology program focused primarily on other animals in the area, forcing him "to get up to snuff on birds."

There was a data gap in the reptile world, he said, so he started working with Jen and the trapping program.

"And I started to really love working with reptiles," he said. "They tend to be in really diverse habitats that I like to be in, like really intense desert habitats. They are a little harder to find, a little more soft-spoken than a lot of animals, and I guess I find that cool," Evan said.

In spite of highlights like working outside and coming across wildlife, work in the ecology program has its challenges and, just like any type of science, there is still a lot of time spent inside analyzing data, responding to emails, attending meetings and working on long-term strategic plans. Biologists also work with people across the Labs when ecology issues come up (such as snakes found inside or near buildings), and while they often are the heroes, there can be difficult moments and conversations.

"It's always hard when something has happened to wildlife. Out here, you come across injured, dying, dead wildlife and that's hard to come across," Evan said.

Overall, the field work and monitoring outweighs the difficult days. And nothing beats those snakes. Evan said both trapping areas used for monitoring this year are home to impressive snakes, such as the ringneck in the southwest area and the western diamondback in the Manzano foothill area.

"The longnose snakes are esthetically very beautiful. Hooknose and hognose snakes are usually very secretive, but we've detected them," Evan said. "There's a rattlesnake that's very rarely seen and it's actually a candidate species for a threatened listing under the Endangered Species Act, and we've had it out here. It's called a desert massasauga. Those are some of the highlights that I really enjoy."

MOSTLY HARMLESS — Vinegaroons may look fierce, but they rarely bite humans unless they feel threatened.

Labs habitats: Sandia biologists conduct baseline inventory monitoring in 40 locations across Sandia lands in 11 habitat types. They dig soil pits and record the layers, which are important for native vegetation growth and health. They also identify plant species and document general climatic information, plant spacing and ground cover, plant and tree height, tree circumference, surface soil stability and more. The data is used to observe long-term changes in the habitat that could be caused by the use or lack of use by animals and humans, changes in climate and changes in soil.

IN THE FIELD — Sandia wildlife biologists Austin Lewandowski (left) and Evan Fahy check a funnel trap for snakes, lizards, frogs and other critters on Sandia property. Only reptiles and amphibians are evaluated, and everything that creeps, crawls, hops and slithers is set free.

Sandia interns sprint to the challenge

Annual new technology competition helps with recruiting

By Michael J. Baker

Four intern teams competed for eight weeks this summer in Sandia's fourth annual NW SPRINT, this time being asked to develop a device with embedded sensors to detect vibration, shock, acceleration and temperature in exposed environments.

The NW SPRINT, which stands for Nuclear Weapons Summer Product Realization Institute, focuses on having nontraditional teams develop innovative concepts using new technologies, identify gaps in those technologies and address the gaps. It also serves to create a recruiting pipeline.

Since its inception in 2015, 14 of the participating interns have either joined Sandia on staff, returned as summer interns or made the transition into year-round interns. Four interns from this summer's winning team have become year-round interns, said Nick Leathe, a mechanical engineer who served on the NW SPRINT leadership team.

2018's winning team from the Advanced Surety Mechanisms Department were Sean Benjamin, University of Rochester; Monty Bruckman, Embry-Riddle Aeronautical University; Ashley Perez, University of Texas at Austin; Glenn Sudjadi, Arizona State University; and Seth Weiss, New Mexico Institute of Mining and Technology.

Sean, Monty, Glenn and Seth have joined Sandia as year-round interns.

This year's devices were evaluated on the accuracy of environments reported, power consumption, data usage and cost. The sensors had to prove functionality by testing in relevant environments. "The students didn't really know what they were going to be subjected to," Nick said.

AND THE WINNERS ARE — The 2018 NW SPRINT winners are, from left to right, Seth Weiss, Monty Bruckman, Ashley Perez, Glenn Sudjadi and Sean Benjamin.

(Photo by Nick Leathe)

Mileposts

New Mexico photos by Michelle Fleming
California photos by Randy Wong

Mark Higuera 45

Jim Phelan 35

Debra Chavez 30

David Castillo 25

Sandra Pacheco 25

Janis Trone 25

John Gonzales 20

Karen Haskell 20

Joyce Lesperance 20

Craig Nakakura 20

Jeremy Walraven 20

Christina Delgado 15

Michal Kuca 15

Bryant Morgan 15

Theresa Ordonez 15

Trish St. John 15

Lisa Theisen 15

SANDIA CLASSIFIED ADS

MISCELLANEOUS

GENERATOR, 3110-W, used twice, $700; small cargo trailer, w/attached hitch, $350; utility trailer, $375; Craftsman tractor plow attachments, $100 ea.; in East Mountains. Willmas, 505-281-9124.

VINTAGE MAGAZINES, Life, McCalls, Better Homes and Gardens, '60s to '80s, great condition & price. Hanks, 505-249-1931.

COUCH, brown synthetic suede, w/2 built-in recliners, w/matching reclining chair, like new, $1,100 OBO. Ludwigsen, 505-553-6231.

STUDENT PICCOLO, Germeinhardt, silver-plated, original price $1,149, asking $800 OBO. Ivey, 505-681-1983.

BACKPACKS, Cannae Pro Gear Phalanx, tactical, Coyote, brand new; 5.11 Covert Box-Pack, Field & Stream, hiking; photos available. Pacheco, 505-816-8501.

ELLIPTICAL, S7100x30, rarely used, like new, original price $1,600, asking $500. Klar, 505-400-8145.

GOLF CLUBS, Nike NDS iron set, 3-PW, right hand, men's, excellent condition, $50. Lester, 505-884-3330.

GRAND PIANO, Baldwin, black, 6'3", black leather bench, in tune, perfect condition, $60,000 new, asking $10,000 firm. Sichler, 505-565-5885.

PIANO, Baldwin Acrosonic, model 2054, pecan, pristine condition, $1,250. Skocypec, 505-822-1046.

FABRIC STEAMER/WRINKLE REMOVER, Norelco Travel Care TS60, boxed, w/pouch & instructions, excellent condition, $12. Wagner, 505-504-8783.

STRESSLESS RECLINER, leather chair & ottoman, classic design, Ekornes brand, purchased at TEMA, $400. Wells, 505-292-0179.

'10 JEEP WRANGLER SPORT RIMS, 17-in., set of 5, w/new spare tire, Goodyear Wrangler. Willis, 505-228-8278.

FLIP PHONE, Motorola/Verizon, call & text, large numeral buttons, tiny screen, $20. Lauben, 505-980-2915.

COUCH, Thomasville, excellent condition, $500 OBO. Romero, 505-298-4966.

CHRISTMAS TREE, Hobby Lobby Colorado pine, w/stand, 9-ft., beautiful, photos available, $100. Mills, 505-450-9767.

DRAFTING MACHINE, Vemco Precision, model 2100-24, w/scales, used once, paid $514, make reasonable offer. Baca, 505-792-1941.

Ad rules

1. Limit 18 words, including last name and home phone (web or email address counts as two or three words, depending on length).
2. Include organization and full name with ad submission.
3. Submit ad in writing. No phone-ins.
4. Type or print ad legibly; use accepted abbreviations.
5. One ad per issue.
6. The same ad may not be run more than twice.
7. No "for rent" ads except for employees on temporary assignment.
8. No commercial ads.
9. For active Sandia members of the workforce, retired Sandians, and DOE employees only.
10. Housing listed for sale is available without regard to race, creed, color or national origin.
11. Work wanted ads are limited to student-aged children of employees.
12. We reserve the right not to publish any ad that may be considered offensive or in poor taste.

TRANSPORTATION

'88 BRONCO, MT, 6-cyl., strong drivetrain, needs TLC, best drivetrain Ford ever made, custom exhaust, sport bar, extra parts. Crawford, 505-697-8948.

REAL ESTATE

3-BDR. HOME, 2 baths, 2,504-sq. ft., beautiful North Valley, large lot, $315,000. Trujillo, 505-440-5487.

314 ACRES, private, fields, stream, forest, Jemez Mountains, adobe rental, $590,000. Marron, 505-345-4006.

WANTED

8-BALL PLAYERS, for Wednesday night handicapped league. Scoglietti, 505-379-2694, ask for Dan.

USED MEN'S RIGHT-HANDED GOLF CLUBS, hybrid, regular flex, standard length, drivers, golf bag cart. Castle, 505-504-4614, call or text Chris.

PART-TIME CHILD CARE, for 8-yr.-old, periodic nights, weekends & overnights needed. Lieberman, 202-494-5472.

How to submit a classified ad

DEADLINE: Friday noon before the week of publication unless changed by holiday.

Submit by one of the following methods:

- EMAIL: Michelle Fleming (classads@sandia.gov)
- FAX: 505-844-0645
- MAIL: MS 1468 (Dept. 3651)
- INTERNAL WEB: Click on the News tab at the top of the Techweb homepage. At the bottom of the NewsCenter page, click the "Submit a Classified Ad" button and complete the form. Questions to Michelle Fleming at 505-844-4902.

Due to space constraints, ads will be printed on a first-come, first-served basis.

Recycling ventures

(Continued from page 1)

It is pursuing private investors and Department of Agriculture-backed loans. And PJ Woodlands now can market its product and negotiate financing. It is also negotiating a site for its new production factory.

Thousands of gallons of (simulated) manure

Instead of corn, Bob Hockaday, president of Tucumcari Bio-Energy, has grand plans to fill his plant's fermentation tanks with manure, which happens to be quite abundant around agricultural Tucumcari, to produce and sell methane-based natural gas. The product is designated a cellulosic biofuel under the Renewable Fuel Standard, which entitles producers to certain federal benefits for helping reduce greenhouse gas emissions. If the company turns a profit, dozens of closed and idle ethanol plants around the country could replicate the model and reopen their doors as well.

To turn manure into fuel, you must churn and carefully heat a slurry — "witch's brew," Hockaday affectionately calls it — of water, manure, digestive bacteria, waste whey from cheese and other ingredients. If the brew doesn't mix evenly, it can overheat and boil over like a foul pot of spaghetti. Even if small areas inside the tanks get too hot or too cold, the bacteria, which ultimately produce the methane, can die or go dormant, respectively.

Perfecting the process through trial and error would have been too costly, so "we said, 'Let's go and use some science on this,'" and they applied to NMSBA, Hockaday explained.

"Some of the best fluid dynamics modeling is done at the national laboratories," Hockaday said. Fluid dynamics is the study of how liquids and gases move.

Nuclear waste simulations

Sal Rodriguez, a nuclear engineer at Sandia, led the effort to identify potential trouble spots in the tanks before adding even a drop, or a plop, of slurry. Using computer software that Sandia normally uses to simulate liquid nuclear waste, Rodriguez mapped out how slurry will circulate inside the tanks when the mixing propeller is spinning, hot fluid is rising, cold fluid is descending and methane gas is bubbling to the top. Rodriguez found areas that weren't expected to mix well and showed Hockaday how to modify the tanks to minimize the risks of over- and underheating. Rodriguez also calculated the ideal temperature range to maximize methane production.

Rodriguez and Hockaday now are working together on the project's second phase to perfect the computer simulation by adding more detailed physics.

"We've got the pieces. We've got the tools," said Hockaday. "I think we can solve the problem."

The project benefits Sandia, Rodriguez adds, because it's improving the Labs' software. Both Hockaday's slurry and nuclear waste happen to share an unusual trait among liquids: both liquids thicken under pressure. This allows Sandia to use one to better understand the other. Improving the software, Rodriguez says, could in turn benefit any facility or institution that keeps or studies nuclear waste.

Taking brush to the bank

Sandia's Structural Mechanics Lab is a rewarding workplace for people like test engineer Tom Bosiljevac who enjoy understanding why things break. The lab is a maze of equipment, from handheld tools to larger-than-life machines, that pull, press, stretch and squeeze with up to hundreds of thousands of pounds of force.

Tom acknowledges, though, that most of the time his job is making sure things don't actually break. He tests materials that Sandia designs to endure intense stress. Through NMSBA, he got to apply his experience to the wood-plastic composite material Altree.

Bosiljevac worked with Albuquerque-based PJ Woodlands on the project, which represented its partners: GL Environmental Inc.; Highway Supply LLC; Mt. Taylor Machine LLC; P & M Lumber Inc.; and P & M Signs Inc.

PJ Woodlands is making plans for a new factory that reuses forest waste: small trees, branches, stumps, leaves and berries that loggers leave behind and that foresters lop, pile and burn to thin wooded areas at high risk of fire. The company turns this forest slash into a fiber which, when blended with No. 2 plastic (like milk jugs), forms a stiff composite material designed to replace aluminum road signs. The company is further developing it as a green structural panel for building projects.

"We deal more with alloys and metals," Tom said. "We were interested in this wood-plastic composite because it's a new material for us, so it helps develop our knowledge base. It also helps us develop our testing abilities and familiarize ourselves with new types of testing equipment." As a small plus, he got to break it, intentionally.

PJ Woodlands can produce Altree at a fraction of the cost of aluminum, one reason managing director Tony Burger believes it's a promising low-cost, alternative material for signage. He says those savings could add up fast for municipalities that spend a bundle each year replacing stolen and damaged signs.

But prospective customers need detailed specs about the new material — how much weight it can hold, how fast it burns, how tightly it holds onto nails and screws and more. So PJ Woodlands asked Sandia for help measuring the material's limits.

"We knew it was good, but we didn't know to what degree," Burger said.

This kind of testing is common but expensive because industry-standard methods can be very prescriptive and require specialized equipment.

Not only did the testing provide PJ Woodlands the specifications it needed for new customers and financing, but it also revealed a potential new market for Altree as a ballistic material.

Tom and his team discovered that while it's not strong enough to stop a bullet, Altree absorbs a lot of energy before breaking, and it doesn't shatter, so it doesn't create hazardous shrapnel. Engineers see potential in such materials because their ability to absorb energy makes buildings more seismic- and blast-resistant.

TOUGH STUFF — Tony Burger, managing director of PJ Woodlands, displays samples of Altree, holding a handful of wood fiber. (Photo by Norman Johnson)

In addition to Tucumcari Bio-Energy and PJ Woodlands-led Altree development, NMSBA recognized two other Sandia-led projects in 2018:

- The Labs helped Albuquerque company Voss Scientific improve the performance of a dime-sized sensor that measures short bursts of electrical current.
- Sandia was also recognized for ongoing service to the small business community through its geometric dimensioning and tolerancing courses, which teach business owners how to add value to products with precision manufacturing.

Sandia Gives Campaign October 8-26, 2018

Annual opportunity to help domestic violence victims and more

By Katrina Wagner

You've reached a breaking point. In the middle of the night, you see an opportunity and you escape with only the clothes on your back. You have no food, your kids have no diapers, and you've been beaten and sexually assaulted by your partner.

This is a reality for as many as 5,000 victims seeking help every year at the Family Advocacy Center (FAC). Open 24 hours a day, 7 days a week, the center is a community resource in downtown Albuquerque for multiple agencies.

There, the Domestic Violence Services Center, Sexual Assault Nurse Examiners and the Albuquerque Police Department provide services to victims of interpersonal crime. Other agencies that share the space include the Rape Crisis Center of Central New Mexico and Para los Niños, which provides medical evaluations for children and adolescents who have been sexually abused and assaulted.

STOCKING UP — Bev McMillan, marketing and fundraising coordinator, takes stock of the snack pantry at the Family Advocacy Center, where victims escaping abuse can get canned food, peanut butter, rice, beans and other food. (Photo by Katrina Wagner)

The center was created in 2007 in response to the ongoing crisis of interpersonal crime in the community. United Way of Central New Mexico collaborated with the City of Albuquerque, Albuquerque Police Department and multiple non-profit agencies to establish it with funding from corporate partners, including Sandia. The United Way served a unique role in bringing together partners and funders to provide a needed community resource.

The organizations work together to reduce victims' stress by giving them access to medical care, advocacy, and legal and financial assistance, as well as access to law enforcement and prosecution in a single location.

Helping victims meet basic needs after fleeing abuse

Since many clients leave domestic violence situations without their belongings, FAC helps to meet basic needs. For example, a donation room was recently transformed from a crowded space with bags and boxes full of clothes into a functioning closet where victims can choose clothing they like with dignity.

Bev McMillan, marketing and fundraising coordinator for the center, says, "They've been beaten, they're in trauma. Now they can come to the closet and find what they need without adding extra stress. Their self-esteem is already low; they're leaving with the clothes on their backs."

Two United Way donor groups with strong Sandia connections, Guys Give and Young Leaders Society, recently worked together to transform the closet space. "Volunteering with Young Leaders Society and Guys Give on the Family Advocacy Center closet organization project was fun. Providing a small semblance of order and dignity with a neat and organized clothes closet during a chaotic time in a family's life really can be helpful," says Shauna Adams, a surety engineer at Sandia.

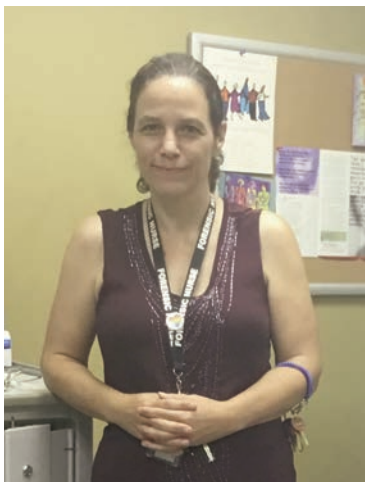
Randy Woodcock, an officer of Guys Give, also worked on the closet project. "I can't imagine how stressful it must be for a victim to leave their home with nothing. I love that they have a closet filled with clothes and diapers and other essentials for victims, and was happy to spend a Saturday remodeling it and building shelves so the clients can enter and select what they need at that critical time."

Guys Give members decided to give all their donations to the center this year "because as men, we value family and we think we have a role in spreading the word that interpersonal violence isn't appropriate anytime, anywhere. We want to serve as an example to other men," says Woodcock. Guys Give chair and Sandia procurement manager Jac Pier says, "There are so many negative perceptions of men in society. Guys Give supports the work of the Family Advocacy Center as an opportunity to show what we should and do stand for as an organization."

Victims of sexual assault find compassionate medical care

One organization key to the center's work, the Albuquerque Sexual Assault Nurse Examiners collaborative, operates there. The nurses provide immediate, comprehensive medical treatment and forensic evaluation for sexual assault victims. Gail Starr, a registered nurse, says, "before the FAC, the victim would go across town to get a sexual assault exam. Now we have an incredible space where we can focus on patient care." The collaborative offers forensic photography, pregnancy prevention and sexually transmitted infection prevention to patients.

"We are a non-report state, but we keep rape kits for two years" in case a victim decides they want to report to law enforcement, she says. "When we see a domestic violence victim, they haven't eaten in a while. We give them snacks. We try to show them understanding and let them know they're not alone. It's not just them," Starr says.



STARR TREATMENT — Gail Starr, RN and nurse examiner with the Sexual Assault Nurse Examiner Collaborative, awaits her next client at the Family Advocacy Center. (Photo by Katrina Wagner)

GETTING ORGANIZED — Sandia computer scientist Matthew Hoffman from Guys Give and Sandia engineers Imani (left) and Shauna Adams of the Young Leaders Society organize the clothing closet at the Family Advocacy Center where domestic violence victims can find items such as diapers, socks, underwear and other clothing after escaping an abusive situation. (Photo by Paul Vuchetich, United Way)

The nurses collaborative also gives each victim a change of clothes and a place to shower. "Our nurse examiners are Safe Zone trained to support the lesbian, gay, bisexual, transgender, queer and intersex community," says Starr. Since the Me Too movement, the nurses collaborative and the center are seeing an increasing number of men who feel safe enough to seek services for domestic violence and rape.

The nurses group provides education and counseling to help victims through their trauma. Starr says. "Strangulation is one of the tools used by rapists and domestic violence offenders because the victim stops fighting," she says. "This is a red flag because if strangulation is a tool being used by the offender, the victim is likely to be killed if they stay with them."

Call to action – how you can help

The Sandia Gives Campaign is the Labs' annual opportunity to come together and act with the common goal of helping our communities through the United Way. During this year's Sandia Gives campaign, donors can continue to designate funds for any of the community collaborative efforts, including the Family Advocacy Center, Mission: Graduate and Mission: Families. Giving to these programs allows employees to advocate for improved lives for everyone in the community and help Albuquerque become a safer place to work and live.

"The United Way is playing a role in the community's response to what is a tragedy in our community," says Jeanette Brahl, chief communications officer for the United Way. The FAC "is a practical response to a community challenge. The education of young people to break the cycle of abuse is so important. It's great to have a response but it would be better to prevent," says Brahl.

The United Way of Central New Mexico's Mission: Families and Mission: Graduate are intertwined with the work of the Family Advocacy Center. When a victim leaves home, the children either are not going to school or are having trouble focusing. The goal of Mission: Families is to provide safety, security and stability in the lives of the families served.

Getting involved through donor groups

United Way supports several leadership giving groups that are recruiting new members. Members of the donor groups are passionate about creating positive change in central New Mexico by offering their time, talent and donations.

Guys Give is a group of men (and women) who are philanthropic community leaders.

The Hispano Philanthropic Society is a collaboration between the Albuquerque Hispano Chamber of Commerce and United Way of Central New Mexico aimed at recognizing Hispanic leadership in philanthropy and encouraging all Hispanics to become engaged in building stronger, healthier neighborhoods and communities through focus on middle school success.

Women United is devoted to giving women a greater voice in the community as leaders and philanthropists.

The Young Leaders Society inspires, educates and encourages young leaders in central New Mexico to effect lasting change in the community.

Lab News wants YOU . . . to write

Got an idea for a story about one of Sandia's many accomplishments or exciting work? Let the Lab News know. Jot down some ideas and background information, or draft a story detailing the who, what, when, where, why and how so Lab News readers can learn more. Lab News also seeks guest columnists with observations on life at the Labs or on science and technology in the news and in contemporary life. If you've written a column (500-750 words) or have an idea for a column or a story to submit, please contact acting editor Jim Danneskiold at jddanne@sandia.gov.